Mind, Materialism, and Consciousness

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Abstract

Within academia, there is an urgency to provide some sort of purely materialistic explanation for both the mind and human consciousness. However, in reducing the mind to nothing more than neuronal firing patterns, science has placed itself in the unenviable position of having to explain why animals do not possess consciousness, since they share many of those same neuronal firing patterns. This paper investigates the mind, and whether or not animals possess consciousness. Our findings indicate that materialism is unable to explain the numerous important differences between humans and animals in regard to mind and consciousness. Rather, the capability of the human brain to network with the human mind, and the singularly unique human characteristic of consciousness, point forcefully to an intelligent Designer.

(Note: In this paper, SMALL CAPS indicate emphasis in original; *italics* indicate emphasis added. Words in [brackets] added by the authors.)

The Brain, the Mind, and Human Consciousness

We suspect that it hardly will come as any great shock for us to observe that, "somehow," brains, minds, and consciousness are viewed as "going together." Brains are "mysteriously" linked to minds. Paul Ehrlich commented: "[W]hen we think of brains, we ordinarily think of minds, just as when people think of legs they think of walking and running…." (2000, p. 109). True enough. And, as Colin McGinn opined: "There just HAS to be some explanation for how brains [interact with] minds" (1993, p. 6).

But minds, just as "mysteriously," are linked to consciousness. When we think of minds, we also think of consciousness, a fact that physicist Freeman Dyson of Princeton's Institute for Advanced Study discussed in his semi-autobiographical book, *Disturbing the Universe*.

> *It is remarkable that mind enters into our awareness of nature on two separate levels.* At the highest level, the level of human consciousness, our minds are somehow directly aware of the complicated flow of electrical and chemical patterns in our brains. At the lowest level, the level of single atoms and electrons, the mind of an observer is again involved in the description of events…. But I, as a physicist, cannot help suspecting that there is a logical connection between the two ways in which mind appears in my universe…. That is to say, *I think our consciousness is not just a passive epiphenomenon carried along by the chemical events in our brains, but is an active agent* forcing the molecular complexes to make choices between one quantum state and another (1979, p. 249).

The undeniable fact that brains are linked to minds, and that minds are linked to consciousness, has produced a true conundrum for evolutionists. As science writer James Trefil asked: "How can we go from a purely physical-chemical system such as the brain to something nonphysical such as our mental experience? What, in other words, is the connection between the firing of neuron 1,472,999,321 and my EXPERIENCE of seeing blue?" (1997, p. 180). In an "invited review" on the subject of consciousness that he was asked to write for the journal, *Brain*, Adam Zeman commented on what he referred to as "the current fascination with consciousness," and suggested that it "reflects the mounting intellectual pressure to explain how 'vital activity' in the brain generates a 'mental element' with rich subjective content" (2001, p. 1284).

There is indeed "mounting intellectual pressure" to explain the brain's "vital activity," which somehow generates the "mental element" we know as consciousness. After all, consciousness, we are assured, is "our most precious possession." Surely, that alone would serve to justify a serious and sustained investigation into the "rich subjective content" of human self-awareness.

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Materialism, Supernaturalism, and the Brain/Mind Connection

Truth be told, however, from an evolutionary perspective, the investigation is extremely self-delimiting. After all, evolution, by definition, is a naturalistic process. George Gaylord Simpson once noted: "Evolution is a *fully natural process*, inherent in the physical properties of the universe, by which life arose in the first place and by which all living things, past or present, have since developed, divergently and progressively" (1960, p. 969). If evolution is accepted as the correct explanation of human origins, and if evolution is a "fully natural process," then whatever exists *must* be the result of purely naturalistic processes. In short, to paraphrase McGinn, "there just *has* to be" some *naturalistic* explanation for how the brain produces the mind, and for how the mind, in turn, produces consciousness. As Christopher Wills wrote in his volume, *Children of Prometheus:* "[T]he human brain is the most remarkable product of evolution to be found among the Earth's living organisms" (1998, pp. 228–229). Ehrlich similarly concluded: "Evolution is the key to the mind" (p. 109).

As you might expect, whatever the evolutionary explanation turns out to be for how the brain gave rise to the mind, and how the mind then gave rise to consciousness, *material causes ultimately were responsible; nothing supernatural was involved!* As Heinberg noted:

> But if the existence of purpose in organisms is problematic for the purely mechanistic explanation of life—and for the more general philosophy of MATERIALISM, which holds that all observable phenomena are explainable as the results of material causes—consciousness is doubly so…. Understandably, *reductionist and materialist science—which is at war with theistic philosophies and features a non-physical God at the center of cosmos and creation—has therefore sought to find purely physical, chemical explanations for consciousness in humans and other creatures* (1999, p. 68).

It should not surprise us, then, to see evolutionist Andrew Brown, writing in *The Darwin Wars*, state: "All working biologists agree that intelligence, curiosity, free will and so on are produced by the normal, law-bound mechanical processes of the world" (1999, p. 154). James Trefil observed in *101 Things You Don't Know about Science and No One Else Does Either:* "Let me define materialism as the belief that the brain is a physical system governed by knowable laws of nature, and that *every phenomenon (including mental phenomena) can ultimately be explained in this way*" (1996, pp. 187–188). Elbert remarked in *Are Souls Real?*:

> The brain is all that is needed for consciousness…. Modern knowledge of the brain and CONSCIOUSNESS SUPPORTS THE IDEA THAT CONSCIOUSNESS RESULTS FROM THE OPERATION OF THE CENTRAL NERVOUS SYSTEM, ESPECIALLY THE BRAIN. Nothing else seems to be needed to generate consciousness…. In my opinion, there is NO GOOD REASON TO BELIEVE THAT THE MIND NEEDS A SUPERNATURAL EXPLANATION (2000, pp. 222, 249, 255).

Donald Griffin (of animal-consciousness fame) was equally blunt in his assessment.

> I will take it for granted that behavior and consciousness (human and nonhuman) result entirely from events that occur in their central nervous systems. In other words, *I will proceed on the basis of emergent materialism*, and assume that subjective consciousness is an activity of central nervous systems, which are of course part of the physical universe. Just what sort of neural activity leads to consciousness remains a challenging mystery,…but *there is no need to call upon immaterial, vitalistic, or supernatural processes to explain how some fraction of human or animal brain activity results in conscious, subjective thoughts and feelings* (2001, p. 5, parenthetical item in orig.).

Neurophysiologist and Nobel laureate Ragnar Granit, in an article on "Reflections on the Evolution of the Mind and Environment," admitted: "Like so many other biologists, I think of mind or conscious awareness as an emergent property in the evolution of life. This implies that it exists *in nuce* [necessarily] in properties of matter, just as does the insulin molecule or the double helix containing DNA" (1982, p. 97).

Richard Gregory, in his discussion on "Consciousness" in *The Encyclopaedia of Ignorance*, suggested that when it comes to the appeal to the supernatural, "there is no such evidence BETWEEN brains, and no evidence WITHIN brains, for non-physical causes" (1977, p. 277). Francis Crick, in *The Astonishing Hypothesis*, provided what may well be the most complete and well-thought-out statement of the scientific materialists' view of the human brain ever to be put into print.

> You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll's Alice might have phrased it: "You are nothing but a packet of neurons" (1994, p. 3).

Or, as Robert Wesson put it in *Beyond Natural Selection:* "The mind is no more independent of the body than living creatures are independent of their physiology" (1997, p. 277). E.O. Wilson intoned: "Virtually all contemporary scientists and philosophers expert on the subject agree that the mind, which comprises consciousness and rational process, is the brain at work" (1998, p. 98).

The Concept of Mind

Evolutionists speak effusively of an individual cell as containing "previously unimagined complexity and dynamism" (Koch, 1997, p. 207), and the brain (which is composed of between 10 and 100 billion cells!) as being "the most developed and complex system known to science" (Davies, 1992, p. 4). Whence has come the "amazing complexity" that careens through the human body—from the individual cells to the master organ, the brain? And what part does it play in regard to the human mind and human consciousness?

On the one hand, evolutionists freely admit that, even at the cellular level, there is an "unimagined complexity and dynamism." Yet on the other hand, they expect us to believe that, ultimately, this has resulted from a disorganized bunch of macromolecules fortuitously coming together in a "just-so" fashion to produce not only the cell's (and the organism's) incredible intricacy, but also the human mind and its accompanying self-awareness. In fact, Daniel Dennett addressed this very point in *Kinds of Minds*. Speaking specifically about humanity's rise from macromolecules to cells to complete organisms that possess both minds and consciousness, he wrote:

> *These impersonal, unreflective, robotic, mindless little scraps of molecular machinery are the ultimate basis of all the agency, and hence meaning, and hence consciousness, in the world*. It is rare for such a solid and uncontroversial scientific fact to have such potent implications for structuring all subsequent debate about something as controversial and mysterious as minds, so let's pause to remind ourselves of these implications.
>
> *There is no longer any serious informed doubt about this: we are the direct descendants of these self-replicating robots* (1996, pp. 22–23).

The "alternatives" mentioned by Dennett are any concepts which suggest that something other than strict materialism may be at work (concepts that he, as a self-professed atheistic evolutionist, absolutely abhors). "So," said Dennett, "let's see what story can be told with the conservative resources of science. *Maybe the idea that our minds evolved from simpler minds is not so bad after all*" (p. 24).

Notice the progression allegedly involved in all of this. Macromolecules evolved into single-celled creatures, which evolved into multi-celled creatures, which eventually evolved into creatures with "simpler minds," which then evolved into—humans. And at the conclusion of that laborious and time-consuming process, how did the human mind turn out? Apparently, not very well, as Robert Ornstein forthrightly concluded:

> *The mind is a squadron of simpletons*. It is not unified, it is not rational, it is not well designed—or designed at all. *It just happened*, an accumulation of innovations of the organisms that lived before us…. *It is, basically, just another organ* to help a person operate in the world, to stay out of trouble, to eat, sleep, and reproduce. *So why should human beings ever have evolved the ability to know what their mental system is doing, any more than we know what our pancreas is doing? We have not done so. Our natural view of our mental state is deeply distorted* (1991, pp. 2, 7).

Now, let us see if we understand all of this correctly? Nonliving macromolecules gave rise to living cells, which then gave rise to organisms with "simpler minds," which then evolved into humans with minds that are "not unified, not rational, and not well designed," but instead are composed of "a squadron of simpletons." Admittedly, there is a "complicated internal system" with a "previously unimagined complexity and dynamism" that permits humans (and humans alone!) to possess self-awareness, use symbolic language, and be aware of the fact that they one day will die. But, in the end, the human mind "did not spring from a designer," and is "basically, just another organ."

The real truth of the matter is, while evolutionists fall all over themselves to avoid any possible hint that the human mind may have a supernatural origin (what Dennett referred to as a "desperate alternative"), they nevertheless cannot offer an adequate explanation for the concept of mind, or how it could have arisen from "chemical and electrical signals that give rise to such complex effects as cognition and consciousness." Renowned physiologist Sir Charles Sherrington remarked in his book, *Man on His Nature*: "A radical distinction has therefore arisen between life and mind. The former is an affair of chemistry and physics; the latter escapes chemistry and physics" (1975, p. 230). Max Delbrück, the father of molecular genetics and a Nobel laureate, found even more deeply puzzling the matter of how human rationality could have evolved out of "natural" occurrences. He wrote:

> Why, then, do the formal operations of the mind carry us so much further? Were those abilities not also matters of biological evolution? If they, too, evolved to let us get along in the cave, how can it be that they permit us to obtain deep insights into cosmology, elementary particles, molecular genetics, number theory? To this question I have no answer (1978, p. 353; cf. also Delbrück, 1986, p. 280).

E.O. Wilson noted in his book, *Consilience:* "But even as mind-body dualism is being completely abandoned at long last, in the 1990s, *scientists remain unsure about the precise basis of mind*" (1998, p. 99). Nobel laureate Roger Sperry commented in a similar vein:

> At the same time the evidence shows that *the great bulk of the evolving web of creation is governed by a complex pattern of great intricacy* with many mutually reinforcing directive, purposive constraints at higher levels, particularly. *The "grand orderly design" is, in a sense, all the more remarkable for having been self-developed*….
>
> The point is that human nature and these *higher kinds of controls in nature* don't reduce any more to physical and chemical mechanisms, but *have to be reckoned with now in their own form, in their own right. Vital, mental, social and other higher forces*, once evolved, become just as real as the evolved forces of molecules and atoms and *must be given their due, over and above the elementary physical components* (as quoted in Cousins, 1985, pp. 85–86, 87).

In an interview ("You Have to be Obsessive") in the February 17, 2003, issue of *Time* magazine, the cover-story article of which was intended to celebrate the fiftieth anniversary of James Watson and Francis Crick's discovery of the structure of DNA, Dr. Watson commented:

> We have more frontiers [in biology] now than when I was getting started. *How the mind works, for example, is still a mystery*. We understand the hardware, but we don't have a clue about the operating system. There are enough questions to keep people occupied for the next hundred years (2003, p. 52).

Writing on the subject, "What is Mind?," for the online journal, *Brain & Mind* (for which she serves as editor), Silvia Cardoso asked:

> But...what about the mind?… [A] few neuroscientists, such as the Nobel Prize recipient Sir John Eccles, asserted that the mind is distinct from the body. But most of them now believe that all aspects of mind, which are often equated with consciousness, are likely to be explained in a more materialistic way as the behavior of neuronal cells. In the opinion of the famous neurophysiologist José Maria Delgado [1969, p. 30]: "It is preferable to consider the mind as a functional entity devoid of metaphysical or religious implications *per se* and related only to the existence of a brain and to the reception of sensory inputs" (1997/1998).

Yet Cardoso admitted:

> Mind is a definition which tries to rescue the essence of man. *The essence of a person arises from the existence of mental functions* which permit him or her to think and to perceive, to love and to hate, to learn and to remember, to solve problems, to communicate through speech and writing, to create and to destroy civilizations (1997/1998).

Daniel Dennett, in *Kinds of Minds*, wrote: "It's easy enough to see why a mind seems miraculous, when one has no sense of all the components and how they got made" (1996, pp. 153–154). Trefil asked:

> The mind is…well, what is it, exactly? Formal definitions usually mention something like "the sum of mental activities," but that doesn't tell us very much. On the other hand, we all have had the experience of mind. Close your eyes and think of an episode from your childhood. You probably can conjure up a fairly detailed visual image of some setting, maybe even some sounds and smells. *You have these images "in mind," but where, exactly, are they*?… (1996, pp. 217–218, first ellipsis in orig.).

This question of "where" has troubled materialistic evolutionists for decades.

Can "mind" be reduced simply to "the firing of neurons"? In addressing this very issue, E.O. Wilson wrote:

> Most believe that the fundamental properties of the elements responsible for mind—neurons, neurotransmitters, and hormones—are reasonably well known. *What is lacking is a sufficient grasp of the emergent, holistic properties of the neuron circuits, and of cognition, the way the circuits process information to create perception and knowledge*…. Who or what within the brain monitors all this activity? No one. Nothing. The scenarios are not seen by some other part of the brain. They just ARE…. Consciousness is the massive coupled aggregates of such participating circuits (Wilson, 1998, pp. 109, 110).

The last part of Dr. Wilson's quote is another terrific example of a "just-so" story. But notice what he admits is "lacking" in regard to explaining mind and/or consciousness—a sufficient grasp of the emergent, holistic properties of the neuron circuits, and of cognition, the way the circuits process information to create perception and knowledge. Physicist Erwin Schrödinger correctly pointed out, in fact:

> *Not every nervous process, nay by no means every cerebral process, is accompanied by consciousness*. Many of them are not, even though physiologically and biologically they are very much like the "conscious" ones, both in frequently consisting of afferent impulses [conveying nerve impulses to the central nervous system] followed by efferent ones [conveying nerve impulses away from the central nervous system]… (1967, p. 101).

In an article on "Brain, Mind and Behavior," Malcolm Jeeves recognized what he called the "take-home message" in regard to the brain-mind problem.

> Nevertheless, the same take-home message emerged from all of these studies, whether human or animal, namely, the remarkable localization of function in the brain and the specificity of the neural substrate underlying mental events. *As each advance occurred, mind and brain were seen to be ever more tightly linked together* (1998, p. 81).

Evidence of the fact that the "mind and brain" are indeed "tightly linked together" came to the forefront between May 1973 and February 1974 when three teams of American astronauts participated in prolonged orbital flights known as the Skylab Program. During this exercise, astronauts spent 84 days in space—longer than ever previously attempted. The flights were designed to enable ground-based specialists to monitor the health of people in space. One of NASA's principal discoveries was that on the day the astronauts were due to return to Earth (and thus, admittedly, a day that they would have been under a great deal of stress), the astronauts' immune systems were visibly affected. Important processes in the immune system (such as white-cell transformation) were abnormally depressed. Remember: the astronauts' environment had not changed. The "matter" that surrounded them had not changed. Yet their mental states had changed dramatically. This provided additional evidence which documented that the mind could have a physical effect on the body. But how can the mind do that if it is merely a brain made up of neuronal circuits?

Brain researcher Roger Sperry spent his entire adult career trying to get "a sufficient grasp" of the "brain/mind problem." It was from that perspective that he admitted:

> I have not been inclined to look particularly at the little molecules of the brain or even at its big macro-molecules in this connection. *It has always seemed rather improbable that even a whole brain cell has what it takes to sense, to perceive, to feel or to think on its own*" (1977, p. 424).

Roger Lewin of Harvard spoke to this when he said:

> *The magic of it all is that while no single neuron is conscious, the human brain as a whole is*…. How does it do it? How are simple electrical signals across individual cell membranes transformed into cascades of cognition? How are billions of individual neurons assembled into a brain, seat of the mind? (1992, p. 163).

One of the overriding questions in regard to the so-called brain/mind problem, as Dr. Lewin noted, is how a single cell (i.e., a neuron) that *is not conscious* somehow *becomes conscious*. As Dennett put it:

> Each cell—a tiny agent that can perform a limited number of tasks—is about as mindless as a virus. Can it be that enough of these dumb homunculi—little men—are put together the result will be a real, conscious person, with a genuine mind? According to modern science, there is no other way of making a real person (1996, p. 23).

He is absolutely right. According to modern science, "mind" does not, and cannot, arise out of the "mindlessness" of "just" brain cells. Gordon Rattray Taylor, in *The Natural History of the Mind*, presented and discussed the medical evidence concerning consciousness, and concluded: "*Consciousness thus cannot be a property of neurones as such*"

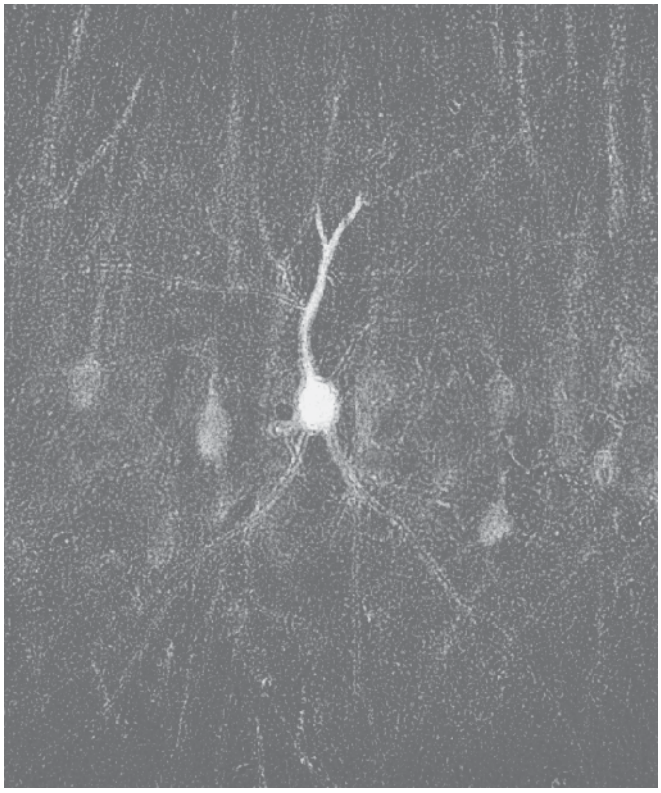

Figure 1. Is human consciousness held within single neurons?

(1979, p. 75; "neurones" is the British spelling for neurons). Susan Greenfield, writing in 2002 on "Mind, Brain and Consciousness" for the *British Journal of Psychiatry*, concluded:

> *Within each macro brain region there is no single isolated complete function*…. So brain regions are bit players on the brain stage, and not autonomous units…. We can no more attribute autonomous functions to the most basic level of brain function—genes—than we can to the most macro—the brain regions. In both cases there is very little room for manoeuvre and *therefore it is hard to see how personalisation of the brain—the mind—might develop* (2002, p. 91).

As odd as it may sound, some researchers, in order to avoid the problem of how the mind could develop consciousness, have opted for exactly the opposite—that consciousness developed the mind! In his book, *Enchanted Looms: Conscious Networks in Brains and Computers*, Rodney Cotterill boldly suggested: "*I believe…that it is the mind that is the product of consciousness*. I believe, moreover, that it is the sheer abundance of experience mediated by consciousness that fools us into misunderstanding the nature of this fundamental attribute" (1998, p. 10).

While we were performing the research for this series

of articles, we stumbled across one of the most concise, yet profound, discussions on these points that we have ever seen. Although it was penned eight decades ago, it appears as fresh and current as if it had been written yesterday. In his 1923 book, *Life: Its Origin and Nature*, Hereward Carrington made the following observations.

> *Certainly, the* MATTER *of the brain cannot in itself "think." There is no more reason why a certain specific nervous structure should give rise to active consciousness, than that any other complex living material should do so*. The question is: Does consciousness somehow ARISE from the flow of the nervous currents within the brain? Materialistic science says that the activities of the mind are somehow synonymous with these nervous currents….*The difficulty with this theory is that, for us, the important thing is the shadow and not the horse! And it is also difficult to explain why such a mere by-product should ever have come into being in the process of evolution. Furthermore the specific character of the relationship between these two (mind and brain) is not in the least explained by this formula. It merely states the facts. The primary question still remains: How can a particular thought (apparently a non-material thing) and a particular brain-change (a material thing) be related one to another?* (pp. 45, 49–50, parenthetical items in orig.).

Talk about "cutting to the chase" (and eighty years ago at that!). Carrington was right to ask: "How can a particular thought (apparently a non-material thing) and a particular brain-change (a material thing) be related one to another?" Should the fact that eighty years have passed, and neuroscience still cannot answer these types of questions, tell us something?

Is it possible that the problem lies with evolutionary theory? We are convinced that it does. If one begins with the wrong assumption, one inevitably will reach the wrong conclusion. The eminent biologist Paul Weiss elucidated this principle, from the standpoint of attempting to understand living organisms, when he wrote:

> Maybe our concept of our nervous system is equally inadequate and insufficient, because so long as you use only electrical instruments, you get only electrical answers; if you use chemical detectors, you get chemical answers; and if you determine numerical and geometrical values, you get numerical and geometrical answers. *So perhaps we have not yet found the particular kind of instrument that tells us the next unknown* (as quoted in Smythies, 1969, p. 252; Note: Weiss' comment is included in a discussion of a paper by J.R. Smythies, "Some Aspects of Consciousness," in *Beyond Reductionism*, edited by Arthur Koestler and J.R. Smythies).

After reading Dr. Weiss' assessment, Arthur C. Custance commented in his book, *The Mysterious Matter of Mind:* "Obviously, we shall not even try to INVENT this particular kind of instrument of research so long as we accept the monistic view of mind as really only the outworking of brain…" (1980, p. 23). "Modern science" begins with the wrong assumption (evolution), looks in the wrong place (the brain alone), and is using the wrong equipment (a materialistic viewpoint). As Eccles and Robinson put it:

> The theories of the brain-mind relationship that are today held by most philosophers and neuroscientists are purely materialistic in the sense that the brain is given complete mastery! The existence of mind or consciousness is not denied except by radical materialists, but it is relegated to the passive role of mental experiences accompanying some types of brain action, as in epiphenomenalism… (1984, p. 34).

Sperry was quite blunt in his forceful criticism of such materialism. "When reductionist doctrine tried to tell us that there are no vital forces, just as it also had long taught that there are no mental forces, *materialist science was simply wrong*" (as quoted in Cousins, 1985, p. 77). Or, as Eccles and Robinson went on to note:

> Finally, the most telling criticism of all materialist theories of the mind is against its key postulate that the happenings in the neural machinery of the brain provide A NECESSARY AND SUFFICIENT EXPLANATION OF THE TOTALITY BOTH OF THE PERFORMANCE AND OF THE CONSCIOUS EXPERIENCE OF A HUMAN BEING…. Our opposition to materialism, therefore, has been on exclusively metaphysical and scientific grounds and is not to be read as a veiled *apologia* for religion…. *The history of humanity establishes that there are human attributes—moral, intellectual, and aesthetic attributes—that cannot be explained solely in terms of material composition and organization of the brain* (1984, pp. 37, 169).

It is our contention that consciousness is one of the "human attributes" that "cannot be explained solely in terms of material composition and organization of the brain." But what about other animals?

Do Animals Possess Consciousness?

Stephen Jay Gould concluded that consciousness has been "vouchsafed only to our species in the history of life on earth" (1997, p. ix). Is Dr. Gould correct? Or do other creatures possess self-awareness as well? Certainly, the answer to such a question hinges on the definition one assigns to "consciousness." Ervin Laszlo, founder of the General Evolution Research Group, addressed this problem in *Evolution: The Grand Synthesis*, when he observed:

> The first thing to remember is that we cannot investigate

> the human mind with the methods used to investigate the human brain, or indeed any matter-energy system in the universe. Thoughts, images, feelings, and sensations are "private"; none of us has direct access to the mind of anyone else—not even of his closest friend or relative. Mind can only be investigated through introspection (1987, p. 117).

One way to approach the problem is to define consciousness with the broadest possible stroke and in the simplest possible terms. Steven Harnad, editor of *Behavioral and Brain Sciences*, did exactly that when he defined consciousness as "the capacity to have experiences" (as quoted in Lewin, 1992, pp. 153–154). Penrose followed suit in *The Emperor's New Mind*.

> Although frogs and lizards, and especially codfish, do not inspire me with a great deal of conviction that there is necessarily "someone there" peering back at me when I look at them, the impression of a "conscious presence" is indeed very strong with me when I look at a dog or a cat or, especially, when an ape or monkey in the zoo looks at me. I do not demand that they feel as I do, nor even that there is much sophistication about what they feel. *I do not ask that they are "self-aware" in any strong sense…. All I ask is that they sometimes* SIMPLY FEEL! (1989, p. 383).

If these are the sole criteria for defining consciousness—the capacity to "just have experiences" or to "sometimes simply feel"—then animals obviously possess consciousness, since they "have experiences." The problem is that such simple definitions of consciousness are woefully inadequate (we even would go so far as to say they are, if you will pardon the intended pun, "simply" wrong!). And, by and large, those in the scientific and philosophical communities have acknowledged as much. Robert Ornstein, in his book, *The Evolution of Consciousness*, suggested: "*Being conscious is being aware of being aware*. It is one step removed from the raw experience of seeing, smelling, acting, moving, and reaction" (1991, pp. 225–226).

That "one step" is a mighty *big* step, however! The difference between merely "being aware" (i.e., "just having experiences" or "simply feeling") and actually being "*self* aware" (i.e., *knowing* that you are having experiences, and *knowing* that you are feeling) is colossal—a fact that seems to have eluded some who wish to imbue "other species" with the trait of consciousness. Marian Dawkins, author of the book, *Through Our Eyes Only? The Search for Animal Consciousness*, is a good example. She wrote:

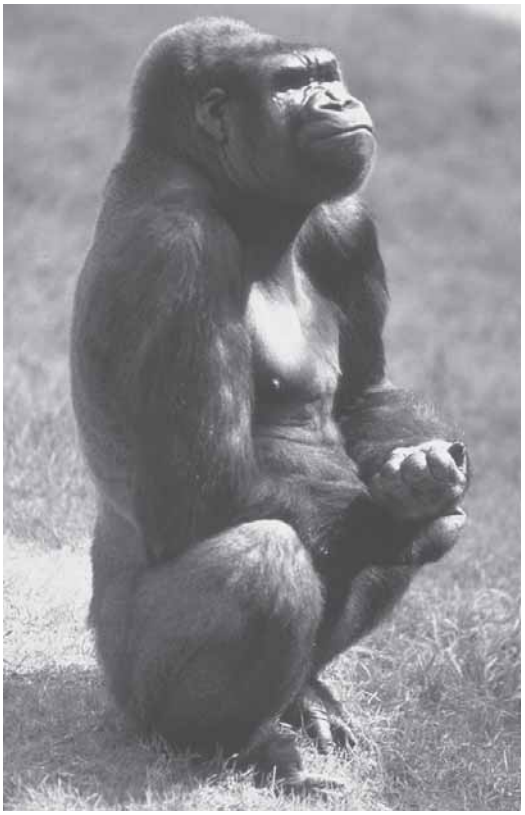

Figure 2. Do animals possess the same self-awareness as humans?

> Our near-certainty about (human) shared experiences is based, amongst other things, on a mixture of the complexity of their behavior, their ability to "think" intelligently and on their being able to demonstrate to us that they have a point of view in which what happens to them MATTERS to them. We now know that these attributes—complexity, thinking and minding about the world—are also present in other species. *The conclusion that they, too, are consciously aware is therefore compelling.* The balance of evidence (using Occam's razor to cut us down to the simplest hypothesis) is that they are and it seems positively unscientific to deny it (1993, p. 177, parenthetical item in orig.).

But we are not talking about other species being "consciously aware." We are talking about them being "consciously *self*-aware." As Laszlo went on to say:

> The human mind, however, is not just the subjective side of a two-sided survival mechanism. The mind, as introspection reveals, is also the seat of abstract thought, feeling, imagination, and value. *I not only sense the world, I also interpret my sensations*. Like presumably all human beings, *I have consciousness. I am aware of having sensations and, on successively higher levels of abstraction, I am aware of being aware of having sensations*. Ultimately I, like other members of the human species, learn to abstract from immediate sensations *in ways that lesser species cannot*, and can come to deal with pure FORMS of thought. These include scientific and mathematical concepts, aesthetic constructions, and the abstract meanings of words and concepts. Consciousness is not a mysterious transcendental trait: it is the capacity for inter-

> nally describing the internal description of the perceived and conceived environment (1987, p. 118).

Peter Wilson, in *Man: The Promising Primate*, therefore concluded:

> It seems to me that human *self-consciousness is something that is "personal" to the human species*, if only in the simple sense that other animals cannot have a consciousness of being human. Anything that is personal to a species cannot have originated or have any meaning in any way other than through self-reference, that is, *the individuals making up the species must think about themselves and must have been in a problematic situation that made thinking about themselves productive and adaptive* (1980, p. 96).

Do other species "think about themselves" in "productive and adaptive" ways? Remember: we are not asking if animals possess instinct. Nor are we asking if they can "adapt." We are inquiring as to whether or not they are *self-aware*—to the extent that they actually "think about themselves." Eccles concluded: "It has been well said that an animal knows, but only a man knows that he knows" (1967, p. 10). Nick Carter, in an article titled "Are There Any Insurmountable Obstacles to Descartes' Dualism?," wrote that we might think of animals "as beings that have extension and sensation, but not thought" (2002). In the context, he was speaking of "higher thought"—the ability to think, to think about thinking, and to let others know we are thinking. Humans not only possess such self-awareness and thought capability, but also *the ability to let other humans know that they possess those two things*! As Harvard's Nobel laureate George Wald concluded:

> *I have all kinds of evidence that other persons are conscious; our mutual communication through speech and writing helps greatly*…. There is no way to shore up scientifically one's prejudices about animal consciousness. One is in the same trouble with nonliving devices. Does that garage door resent having to open when the headlights of my car shine on it? I think not. Does a computer that has just beaten a human player at chess feel elated? I think not. But there is nothing one can do about those situations either (1994, p. 128).

In their book, *Evolution*, Dobzhansky, et al., followed this same line of reasoning.

> In point of fact, *self-awareness is the most immediate and incontrovertible of all realities*. We infer the existence of self-awareness, or mind, in people other than ourselves only by analogy with our own introspective experiences…. No wonder that competent scientists are far from unanimous in their judgments. Some are willing to ascribe the beginnings of mind to some mammals (apes, monkeys, dogs), or even to all animals with developed nervous systems. Other scientists make mind an exclusively human possession. For example, Teilhard de Chardin, in a now-famous statement, wrote: "*Admittedly the animal knows. But it cannot know that it knows—this is quite certain*…." Human self-awareness obviously differs greatly from any rudiments of mind that may be present in nonhuman animals. *The magnitude of the difference makes it a difference in kind, and not one of degree. Without doubt, the human mind sets our species apart from nonhuman animals*. Unfortunately, what we call the mind is notoriously refractory to scientific study (1977, p. 453).

While the mind may be "notoriously refractory to scientific study," there are certain things we do know, in addition to those items mentioned above. As Ehrlich confessed (from an evolutionary viewpoint): "…[H]uman beings are also the only animals that seem fully aware of the consciousness of other individuals and thus have been able to develop empathy, the capacity to identify emotionally with others" (2000, p. 111). Nowhere is this more evident that in the human response to death. Dobzhansky concluded: "Self-awareness has, however, brought in its train somber companions—fear, anxiety and death awareness…. Man is burdened by death-awareness. A being who knows that he will die arose from ancestors who did not know" (1967, p. 68).

But consider (to choose just one example) the animal that evolutionists believe is our closest living relative—the chimpanzee. Famed paleoanthropologist Richard Leakey admitted:

> …[C]himpanzees at best seem puzzled about death…. The chimpanzees' limitation in empathizing with others extends to themselves as individuals: *no one has seen evidence that chimps are aware of their own mortality*, of impending death. But, again, how would we KNOW?… Ritual disposal of the dead speaks clearly of an awareness of death, and thus an awareness of self (1994, pp. 153, 155).

Dobzhansky, et al., also addressed this same point.

> *Ceremonial burial is evidence of self-awareness because it represents an awareness of death. There is no indication that individuals of any species other than man know that they will inevitably die*…. The adaptive function of death awareness is not as clear. What conceivable advantage could our remote ancestors at the dawn of humanity derive from knowing that they would inevitably die?… It is most probable that *death-awareness arose* originally not because it was adaptively useful by itself, but *because it was a by-product of self-awareness*, which was adaptive (1977, p. 454).

The information contained in the two quotations above

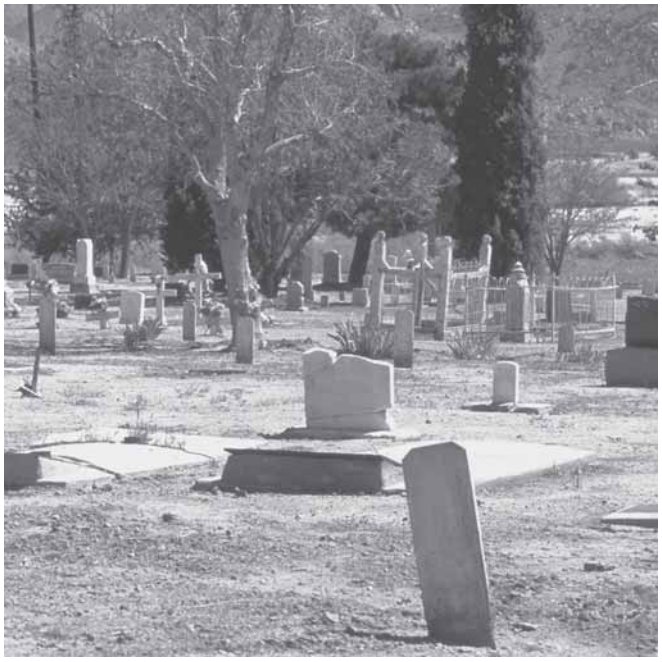

Figure 3. Only humans carry-out elaborate rituals for their dead—an indication that they, unlike animals, are self aware.

can be summarized as follows: (1) chimpanzees are unaware of their own mortality, and have no ability to empathize emotionally with others (a peculiarly human trait, according to Ehrlich); (2) in fact, there is no indication that individuals of *any* species other than humans know they will inevitably die; (3) death-awareness arose because it was a product of self-awareness; and (4) ceremonial burial is evidence of self-awareness because it represents an awareness of death.

Now, note the logical conclusion that inescapably follows. Death-awareness and ceremonial burial are allegedly evidence of, and products stemming from, self-awareness. But chimps (our nearest supposed relative), *like all animals*, do not comprehend the fact that they will one day die, and do not perform ritualistic burials of their dead. *If understanding death and burying the dead are evidence of self-awareness, and if no animal understands death or buries its dead, then no animal is self-aware!*

The scientist who literally "wrote the book" on animal consciousness, Donald R. Griffin, published the first edition of his now-famous work, *Animal Minds: Beyond Cognition to Consciousness*, in 1992, and the second edition in 2001. In that second edition, he offered the following assessment of animal consciousness.

> Can scientific investigation of animal mentality tell us whether animals are conscious? The short answer is "not yet," because it is very difficult to gather convincing evidence about whatever conscious experiences may occur in animals.... Have scientists proved conclusively that animals are never conscious, perhaps by means of evidence so complex and technical (like quantum mechanics) that ordinary people cannot understand it? No, almost all biologists and psychologists who study animal behavior avoid any such sweeping claim, and they often grant that some animals are probably conscious at times. But they hasten to argue that there is no way to tell whether they are or not, and that for this reason the subject cannot be investigated scientifically.... *Although the available evidence does not prove conclusively that any particular animal is conscious*, it is quite sufficient to open our eyes to an appreciative view of animals in which we attempt to understand what life is like for them....
>
> It is important to distinguish between perceptual and reflective consciousness. The former, called "primary consciousness," includes all sorts of awareness, whereas the latter is a subject of conscious experiences in which the content is conscious experience itself. Reflective consciousness is thinking, or experiencing feelings, about thoughts or feelings themselves, and *it is often held to include self-awareness and to be limited to our species*.... Many behavioral scientists...believe that it is likely that animals may sometimes experience perceptual consciousness but that reflective consciousness is a unique human attribute....
>
> *[R]eflective consciousness...is a form of introspection, thinking about one's thoughts, but with the addition of being able to think about the thoughts of others*....
>
> [T]here are in fact several kinds of evidence bearing on the question of animal consciousness.... One type of evidence is especially relevant, and yet it has been almost completely neglected by scientists. This is animal communication. To appreciate its relevance, *we need only ask ourselves how we judge whether our human companions are aware of anything or what the content of their conscious experiences may be. Our chief source of evidence comes from human communication.... The principal difference between human and animal consciousness is probably in their* CONTENT (pp. x, xi, 7, 8, 15).

"The question of animal consciousness," says Dr. Griffin, is an "open one." Admittedly, "reflective consciousness" (which includes, among other things, self-awareness, the process of introspection, and the ability to invent symbolic language—all essential, definitive traits of human consciousness) has eluded every member of the animal kingdom. But, Griffin opined, "the principal difference between human and animal con-

sciousness is probably in their content" (p. 15).

That last statement must surely rank as one of the greatest understatements of all times. "Other than your husband's assassination, Mrs. Lincoln, how did you enjoy the play?" "Except for the difference in their content, what is the difference in human and animal consciousness?" Does anyone besides us see something terribly wrong here? As Tattersall put it:

> But comfortable as monkeys may become with mirrors and their properties, it has also been shown that they cannot identify their own reflection in a mirror…. What do we make of all this? First, it is evident that *there is a qualitative difference among the perceptions of self exhibited by monkeys, apes, and human beings* (2002, p. 65).

Key in on Tattersall's reference to monkeys and mirrors, and allow us to explain the significance of such a concept. For more than thirty years, researchers have tried to determine a way to test—objectively—whether any given animal is "self-aware." In *The Origin of Humankind*, paleoanthropologist Richard Leakey concluded: "An experience as private as consciousness is frustratingly beyond the usual tools of the experimental psychologist. This may be one reason that many researchers have shied away from the notion of mind and consciousness in nonhuman animals" (1994, pp. 149–150). Or, as Griffin noted: "Both reflective consciousness and self-awareness are often held to be uniquely human attributes." Then, in speaking of animals, he asked: "What sorts of evidence might indicate whether or not they think about their own thoughts?" (2001, p. 277).

Good question. What "sorts of evidence" could lead scientists and philosophers to conclude that at least some animals possess self-awareness? There have been a number of suggestions offered, such as mind-reading (i.e., the ability to comprehend what another animal has in mind to do in order to alter behavior), divided attention (the ability to concentrate on more than one thing at a time), delayed response (acting later, as if on the "memory" of something), self-recognition (the ability of an animal to recognize itself, as opposed to other animals of its kind), etc.

But it has been self-recognition, for the most part, that has captured the attention of various researchers. In the late 1960s, one of those researchers was Gordon G. Gallup, a psychologist at the State University of New York, Albany. Dr. Gallup devised a test intended to determine an animal's "sense of self"—the mirror test. His idea was that if an animal were able to recognize its own reflection in a mirror as "itself," then it could be duly said to possess an awareness of itself, i.e., consciousness. Gallup's report of the experiment was published in a 1970 article in *Science*. It has been called "a milestone in our understanding of animal minds" (Leakey, 1994, p. 150). Here is how the test was carried out.

An animal (such as a chimpanzee, an orangutan, or a gorilla) is left in a room to become familiarized with a mirror. After a period time, the animal is gently anesthetized. While it is asleep, a dot is painted on its forehead with paint. The animal then is allowed to wake. After the animal has fully recovered, the mirror is brought back. As Merlin Donald observed in *A Mind So Rare*:

> Most animals will take no notice of the dot and continue to treat the image in the mirror as if it were another animal. But certain ape subjects instantly recognize themselves in the mirror and touch their foreheads as if they knew that (a) the forehead in question was their own and (b) they didn't normally have a dot on it. Monkeys and other mammals do not behave this way. They do not see themselves in the mirror image (2001, p. 141).

In speaking of some of those "ape subjects" (chimpanzees and orangutans), Ian Tattersall remarked:

> Their immediate reaction was to use the mirror as an aid in picking the paint off their faces. Clearly they had recognized themselves, and they were soon pulling faces and exploring their persons using the unfamiliar opportunity. Interestingly, several gorillas tested did not seem to recognize themselves, although one, the famous Koko, a sign language star, definitely does recognize her own reflection (2002, pp. 63–64).

Mirror self-recognition has been extensively studied and discussed since the Gallup experiment, as reviewed in the book, *Self-awareness in Animals and Humans: Developmental Perspectives*, edited by Parker, Mitchell, and Boccia (1994). What, then, should we make of all this? Or perhaps a more appropriate question is: What have *researchers* made of all this? First, as Leakey admitted, "…psychologists wondered how widespread self-recognition would prove to be. Not very, is the answer. Orangutans passed the mirror test, but, surprisingly, gorillas did not" (p. 150). Harvard's Griffin admitted:

> It is difficult to be certain whether the failure of most animals to recognize mirror images as representations of their own bodies demonstrates that they are incapable of self-awareness, as Gallup claims, or whether they fail for some other reason to correlate the appearance and movements of the mirror image with those of their own bodies (2001, pp. 275–276).

Yet, while Griffin acknowledged that when the mirror-test results are in, it still is "difficult to be certain" about whether animals who pass the test are self-aware, he nevertheless went on to say: "On balance, it seems most likely that mirror self-recognition as indicated by the Gallup-type experiment does strongly indicate self-awareness" (p. 276). Donald commented: "A loose hierarchy emerges form these con-

siderations. Bits and pieces of conscious capacity appear in different species. Even perception, short-term memory, flexibility of mind, and mindreading skill might be stronger in one species and weaker in another." However, humans, he concluded, "have more of everything. We might be called superconscious. But other species have many component features of our conscious capacity" (p. 130). But are those "component features" enough to justify animals being thought of as possessing consciousness?

Conceding the obvious—that some of the experimental subjects did appear to recognize themselves in the mirror—Tattersall inquired:

> [T]he fact that most apes recognize their own reflections in mirrors surely is significant at some level, especially when we realize that monkeys do not…. So far so good, perhaps; *but does the ability to recognize oneself in a mirror convincingly demonstrate that one has a* CONCEPT *of self*? This is a tough issue, but most cognitive scientists would, I think, argue that without such a concept individuals would lack any means of interpreting the reflected image, and would thus be unable to recognize themselves. *Nonetheless, even if we accept this, where does it leave us*? It seems equally likely that recognizing one's reflection is only a part—maybe even, just one small consequence—of what we human beings are familiar with as the concept of self (pp. 63–64).

Dr. Tattersall has raised several important points. First, does the ability to recognize oneself in a mirror "convincingly demonstrate that one has a *concept* of self? Second, if we answer yes to such a question "where does that leave us?" And third, is it possible that "recognizing one's reflection *is* 'only a part'—maybe even just one small consequences—of what we human beings are familiar with as the concept of self"?

In his appraisal of the concept of self-awareness, Robert Wesson observed:

> Self-awareness is a special quality of the mind. A computer may be able to analyze difficult problems, but we do not suppose that it is self-aware, that is, has a mind. *Self-awareness is different from information processing*; even when confused and unable to think clearly, one may be vividly aware of one's self and one's confusion. *The essence of mind is less data processing than will, intention, imagination, discovery, and feeling* (1997, p. 277).

Dr. Wesson is correct. Self-awareness *is* different from mere information processing. The chimpanzee or orangutan with a spot of paint on its forehead may be able to process the information that tells the animal it has a spot of paint on its forehead. But does that mean the chimpanzee or orangutan possesses intention, imagination, discovery, feeling, and all the other things that we normally associate with consciousness and/or self-awareness? Hardly. Listen to Daniel Dennett's assessment.

> We human beings do many intelligent things unthinkingly. We brush our teeth, tie our shoes, drive our cars, and even answers questions without thinking. *But most of these activities of ours are different, for we* CAN *think about them in ways that other creatures can't think about their unthinking but intelligent activities….What makes a mind powerful—indeed, what makes a mind conscious—is not what it is made of it, or how big it is, but what it can do*. Can it concentrate? Can it be distracted? Can it recall earlier events? Can it keep track of several different things at once? Which features of its own current activities can it notice or monitor?…
>
> [T]he dog cannot consider its concept. It cannot ask itself whether it knows what cats are; it cannot wonder whether cats are animals; it cannot attempt to distinguish the essence of cat (by its lights) from the mere accidents. Concepts are not things in the dog's world in the way that cats are. Concepts ARE things in our world… (1996, pp. 154–155, 158, 159).

What sets human consciousness apart from animals, with their "bits and pieces" or "component features of conscious capacity" is, as Dennett correctly observed, *what the human mind can do*! Anthony O'Hear assessed the situation quite succinctly when he commented that a "self-conscious person"

> does not simply have beliefs or dispositions, does not simply engage in practices of various sorts, does not just respond to or suffer the world. He or she is aware that he or she has beliefs, practices, dispositions, and the rest. It is this awareness of myself as a subject of experience, as a holder of beliefs, and an engager in practices which constitutes my self-consciousness. A *conscious animal might be a knower…but only a self-conscious being knows that he is a knower* (1997, p. 24).

When Griffin asked "Can scientific investigation of animal mentality tell us whether animals are conscious?," and answered, "not yet" (2001, p. x), he fairly well summed up most researchers' opinion of the matter. While he personally believes that "the weight of the evidence" suggests that many animal species do possess "perceptual consciousness," he nevertheless was willing to admit: "But it remains an open question" (p. 277). And it is safe to say that "the researchers" are badly split on whether or not even "advanced mammals" (like, for example, chimpanzees and orangutans) can justifiably be said to possess self-awareness. For example, three contributors to a 1997 symposium volume (*Animal Consciousness and Animal Ethics*) argued that many animals do have conscious experiences of some sort. But just as many (or more) other contributors disagreed

(see Dol, et al., 1997).

In the book he wrote that contained lengthy interviews with a variety of scientists and philosophers on consciousness (*Complexity: Life at the Edge of Chaos*), Roger Lewin asked Tufts University philosopher Daniel Dennett (the author of *Consciousness Explained*): "So you are denying this kind of consciousness to all animals but humans?" Dr. Dennett responded: "I am." Lewin then remarked: "No animal without language experiences a sense of self, argued Dan, not in the way that humans experience self" (Lewin, 1992, p. 157). We concur, and agree with Gerald Edelman, who wrote: "While we may not be the only conscious animals, we are, with the possible exception of the chimpanzee, the only self-conscious animals" (1992, p. 115).

But *why* is all of this so? W.H. Thorpe was constrained to say: "I find it very difficult to imagine a highly organized consciousness which could be of real use to the animal in its everyday *life without a fairly elaborate mechanism behind it*" (Thorpe, 1965, p. 498).

Humans Created Unique

In evaluating the differences between animals and humans one must understand that from as far back as the Creation week humans were created different from the animals. Biblical teaching regarding man acknowledges that he is composed of two distinct parts—the physical and the spiritual. We get an introduction to the origin of the *physical* portion as early as Genesis 2:7 when the text states: "Jehovah God formed man of the dust of the ground, and breathed into his nostrils the breath of life; and man became a living soul (*nephesh chayyah*)." It is important to recognize both what this passage is discussing and what it is not. Genesis 2:7 *is* teaching that man was given *physical life*; it is *not* teaching that man was instilled with an *immortal nature*. The immediate (as well as the remote) context is important to a clear understanding of the intent of Moses' statement. Both the King James and American Standard Versions translate *nephesh chayyah* as "living soul." The Revised Standard Version, New American Standard Version, New International Version, and the New Jerusalem Bible all translate the phrase as "living being." The New English Bible translates it as "living creature."

The variety of terms employed in our English translations has caused some confusion as to the exact meaning of the phrase "living soul" or "living being." Some have suggested, for example, that Genesis 2:7 is speaking specifically of man's receiving his immortal soul and/or spirit. This is not the case, however, as a closer examination of the immediate and remote contexts clearly indicates. For example, the apostle Paul quoted Genesis 2:7 in 1 Corinthians 15:44–45 when he wrote: "If there is a natural body, there is also a *spiritual body*. So also it is written, 'The first man Adam became a living soul.' The last Adam became a life-giving spirit." The comparison/contrast offered by the apostle between the first Adam's "natural body" and the last Adam (Christ) as a "life-giving spirit" is absolutely critical to an understanding of Paul's central message (and the theme of the great "resurrection chapter" of the Bible, 1 Corinthians 15), and must not be overlooked in any examination of Moses' statement in Genesis 2:7.

There are six additional places in the Old Testament where similar phraseology is employed, and in each case the text obviously is speaking of members of the animal kingdom. In Genesis 1:24, God said: "Let the earth bring forth living creatures (*nephesh chayyah*) after their kind." Genesis 1:30 records that God provided plants as food "to every beast of the earth, and to every bird of the air, and to everything that creeps on the earth, everything that has the breath of life (*nishmath chayyah*)." When the Genesis Flood covered the Earth, God made a rainbow covenant with Noah and with every living creature (*nephesh chayyah*) that was in the ark with Him (Genesis 9:12). God pledged that He would remember the covenant that He made with every "living creature" (*nephesh chayyah*; Genesis 9:12), and therefore He never again would destroy the Earth by such a Flood. The rainbow, He stated, would serve as a reminder of that "everlasting covenant" between God and every living creature (*nephesh chayyah*, Genesis 9:15). The final occurrence of the phrase is found in Ezekiel's description of the river flowing from the temple in which every living creature (*nephesh chayyah*) that swarms will live (47:9).

Conclusion

The Bible declares: "For that which befalleth the sons of men befalleth beasts; even one thing befalleth them: as the one dieth, so dieth the other; yea, they have all one breath; and man hath no preeminence above the beasts" (Ecclesiastes 3:19). Does this mean, therefore, that man possesses only a material nature and has no immortal spirit? No, it does not! In speaking to this very point, Jack P. Lewis wrote:

> It would seem that arguments which try to present the distinctiveness of man from the term "living soul" are actually based on the phenomena of variety in translation of the KJV and have no validity in fact. Had the translators rendered all seven occurrences by the same term,

> we would have been aware of the fact that both men and animals are described by it. To make this observation is not at all to affirm that the Old Testament is materialistic. We are concerned at this time only with the biblical usage of one term. Neither is it to deny a distinction in biblical thought between men and other animals when one takes in consideration the whole Old Testament view. Man may perish like the animals, but he is different from them. Even here in Genesis in the creation account, God is not said to breathe into the animals the breath of life; animals are made male and female; there is no separate account of the making of the female animal; they are not said to be in God's image and likeness; they are not given dominion. Man is the crown of God's creation (1988, p. 7).

When Dr. Lewis suggested that "man may perish like the animals," he captured the essence of the passage in Ecclesiastes 3:19. It is true that both men and beasts ultimately die, and that in this regard man "hath no preeminence above the beasts." Yet while both creatures are referred to as *nephesh chayyah*, the Scriptures make it clear that God did something special in reference to man. Genesis 1:26–27 records: "And God said, Let us make man *in our image, after our likeness*.... And God created man in his own image, in the image of God created he him; male and female created he them." Nowhere does the Bible state or imply that animals are created in the image of God. What is it, then, that makes man different from the animals?

The answer, of course, lies in the fact that man possesses an immortal nature. Animals do not. God Himself is a spirit (John 4:24). And a spirit "hath not flesh and bones" (Luke 24:39). In some fashion, God has placed within man a portion of His own essence—in the sense that man possesses a spirit that never will die. The prophet Zechariah spoke of Jehovah, Who "stretcheth forth the heavens, and layeth the foundation of the earth, and formeth the spirit (*ruach*) of man within him" (12:1). The Hebrew word for "formeth," *yatsar*, is defined as to form, fashion, or shape (as in a potter working with clay; Harris, et al., 1980, p. 396). The same word is used in Genesis 2:7, thereby indicating that both man's physical body and his spiritual nature were formed, shaped, molded, or fashioned by God. The authors of the *Theological Wordbook of the Old Testament* noted:

> The participial form meaning "potter" is applied to God in Isa. 64:7 where mankind is the work of his hand. When applied to the objects of God's creative work, the emphasis of the word is on the forming or structuring of these phenomena. The word speaks to the *mode of creation* of these phenomena only insofar as the act of shaping or forming an object may also imply the *initiation of that object* (Harris, et al., 1980, p. 396).

As the Creator, God "initiates" the object we know as man's immortal nature (i.e., his spirit). Solomon, writing in the book of Ecclesiastes, noted that "the dust returneth to the earth as it was, and the spirit returneth unto *God who gave it*" (12:7). Man's physical body was formed of the physical dust of the Earth. Would it not follow, then, that his spiritual portion would be formed from that which is spiritual? When the writer of Hebrews referred to God as "the Father of our spirits" (12:9), he revealed the spiritual source of the our spirits—God.

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[Authors' Note: This article is an abbreviated discussion of this topic. A more complete treatment may be found in: Harrub, Brad and Bert Thompson. 2003. *The truth about human origins*. Apologetics Press, Montgomery, AL.]